Stormwater Program Update

Stormwater Advisory Board

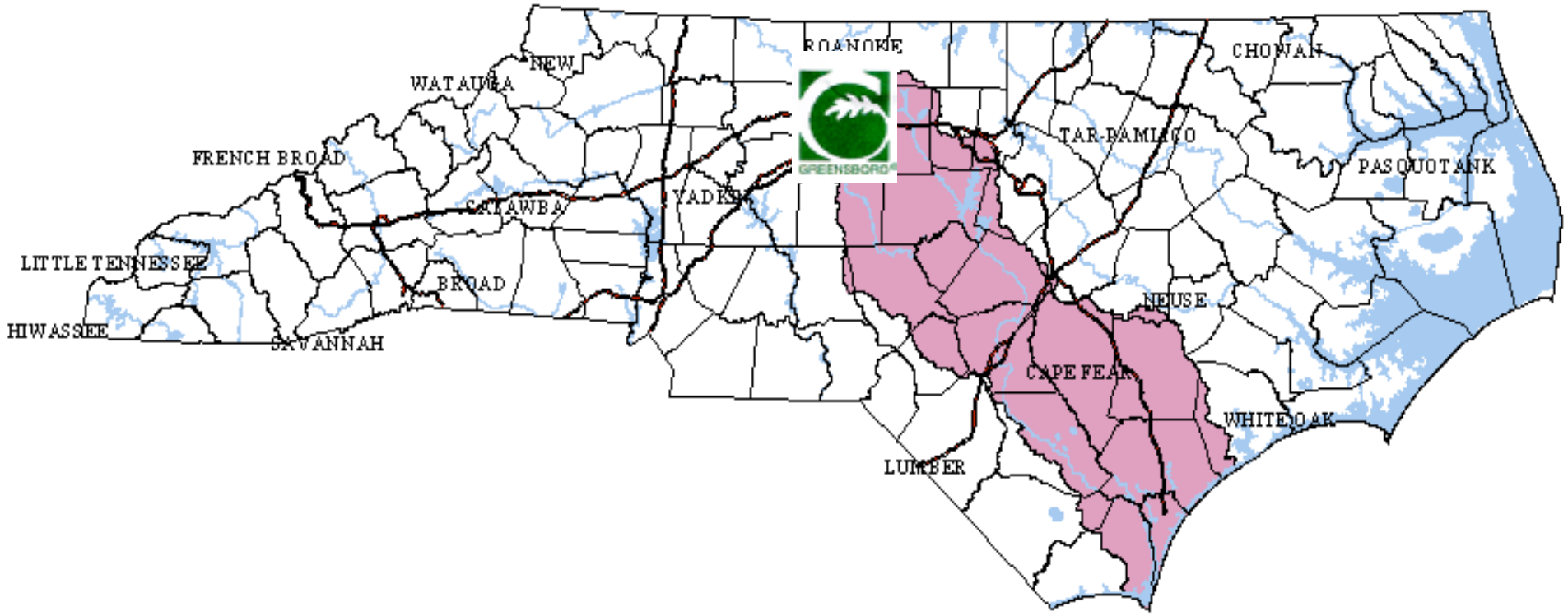
September 22, 2003

City of Greensboro
Water Resources Department
Stormwater Management Division

Today's Agenda

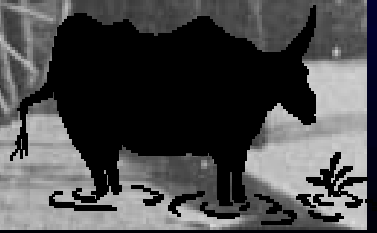
- Welcome & Introductions 4:30 – 5:00
- **Stormwater Program Update** 5:00 – 5:30
- Preview of Stream Buffer & Floodplain Management Policy Discussions 5:30 – 5:45
- Q & A / Adjourn 5:45 – 6:00

Greensboro at heart of North Carolina



1st Surface Water Quality Ordinances - 1889

- Became illegal to dump dirty water into any gutter or street, throw trash into any public well or cistern, damage public pumps, and wash anything within 20 feet of a public well
- Privies required to be cleaned every week
- Business owners required to clean their sidewalks and gutters each Wednesday and Saturday morning
- $5 fine for non-compliance!



Drainage Functions Born in Streets Program

Stormwater Ordinances

- Local NPDES Stormwater quality control (1994)
  - Established Stormwater Utility funding mechanism
  - Reduce discharge of pollutants from MS4 to Maximum Extent Practicable (MEP)
  - Prohibit non-stormwater discharges
  - Right of entry for stormwater-related inspections
  - Illicit discharge and improper disposal
  - Strengthen construction erosion & sediment control
  - Referenced new BMP guidance manual
  - Established administrative and enforcement authority
- Stormwater quantity control (1999)

Greensboro Today

- Population just over 230,000
- Jurisdictional area of 117 mi^2
- City owns & operates its MS4
- Stormwater Utility ~ $7.4 million / year
- Several major streams impaired per State 303(d) list
- About 1/3 of city located in water-supply watersheds
- Moderate flood hazards – participant in FEMA National Flood Insurance Program (NFIP)
- Local erosion & sediment control program
- City growing at about 2% in recent years

The City Stormwater Team

- "Get the right people on the bus"
  - (Management author Jim Collins, Good to Great)
- The people are key to a successful program

Greensboro's Stormwater Vision

- **Core Values**
  - Honesty, Integrity, Stewardship, Respect, Environmental Consciousness
- **Core Purpose**

  To preserve and enhance quality of life through water quality improvement, drainage infrastructure management, flood hazard minimization, and public awareness.
- **Program Goals**
  - 10-year (APWA 2012): To be recognized as a vital partner in Greensboro's future.
  - 20-year (APWA 2022): To be recognized as the best Municipal Stormwater Program in the United States.

Sampling of Major Stormwater Program Components

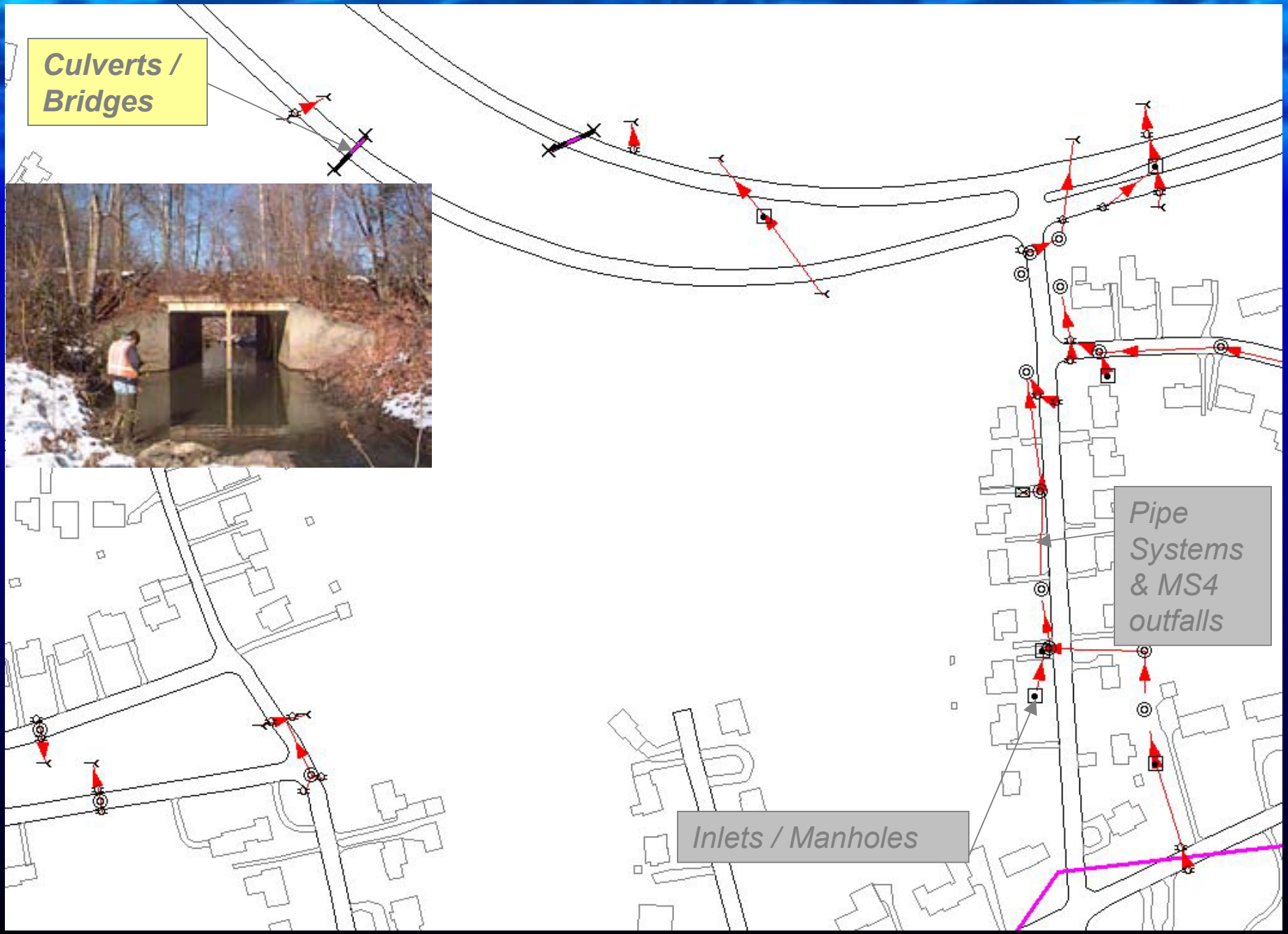
“The Anatomy of the Stormwater and Open Channel Stream System”

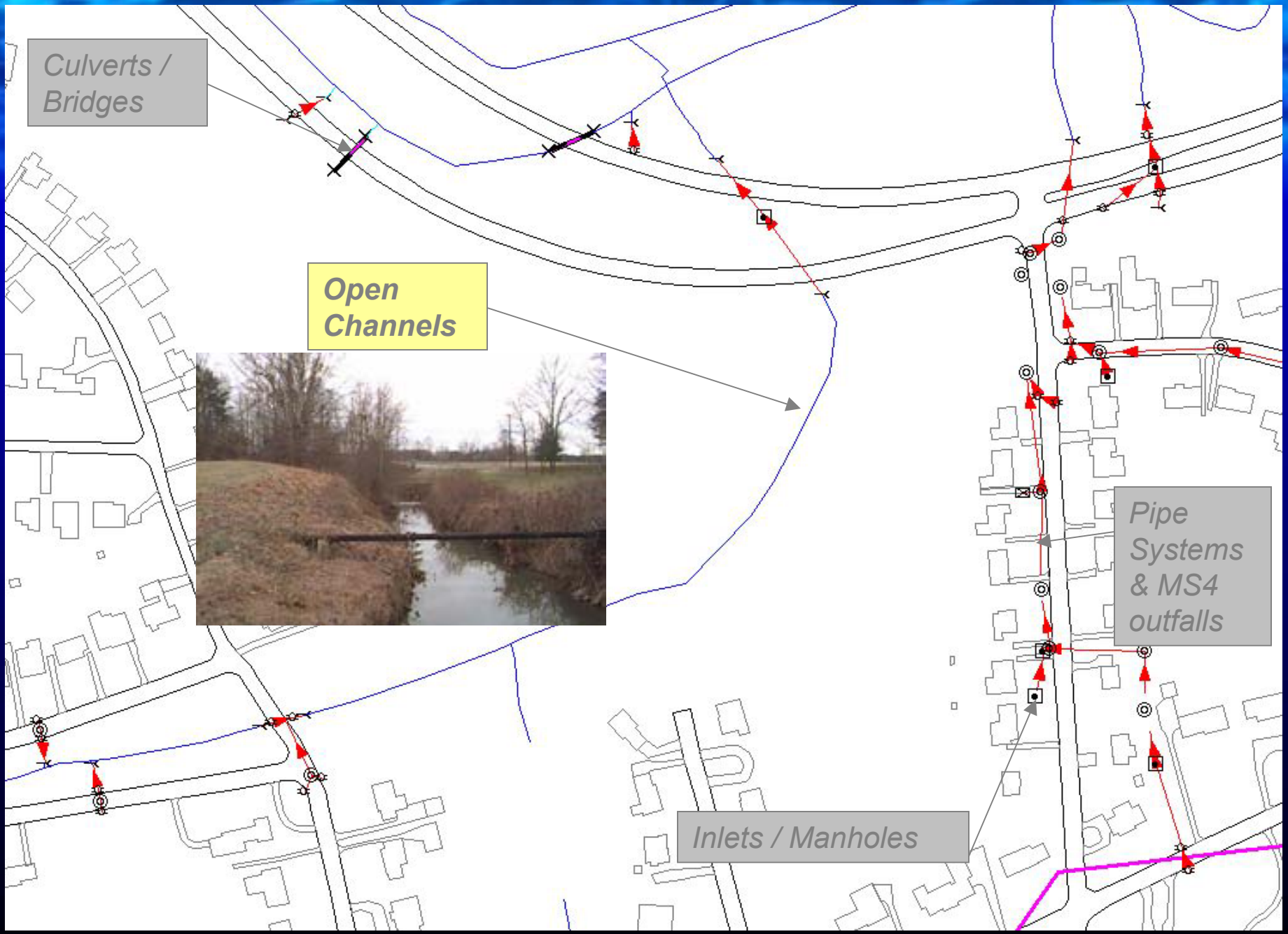
Citywide inventory complete

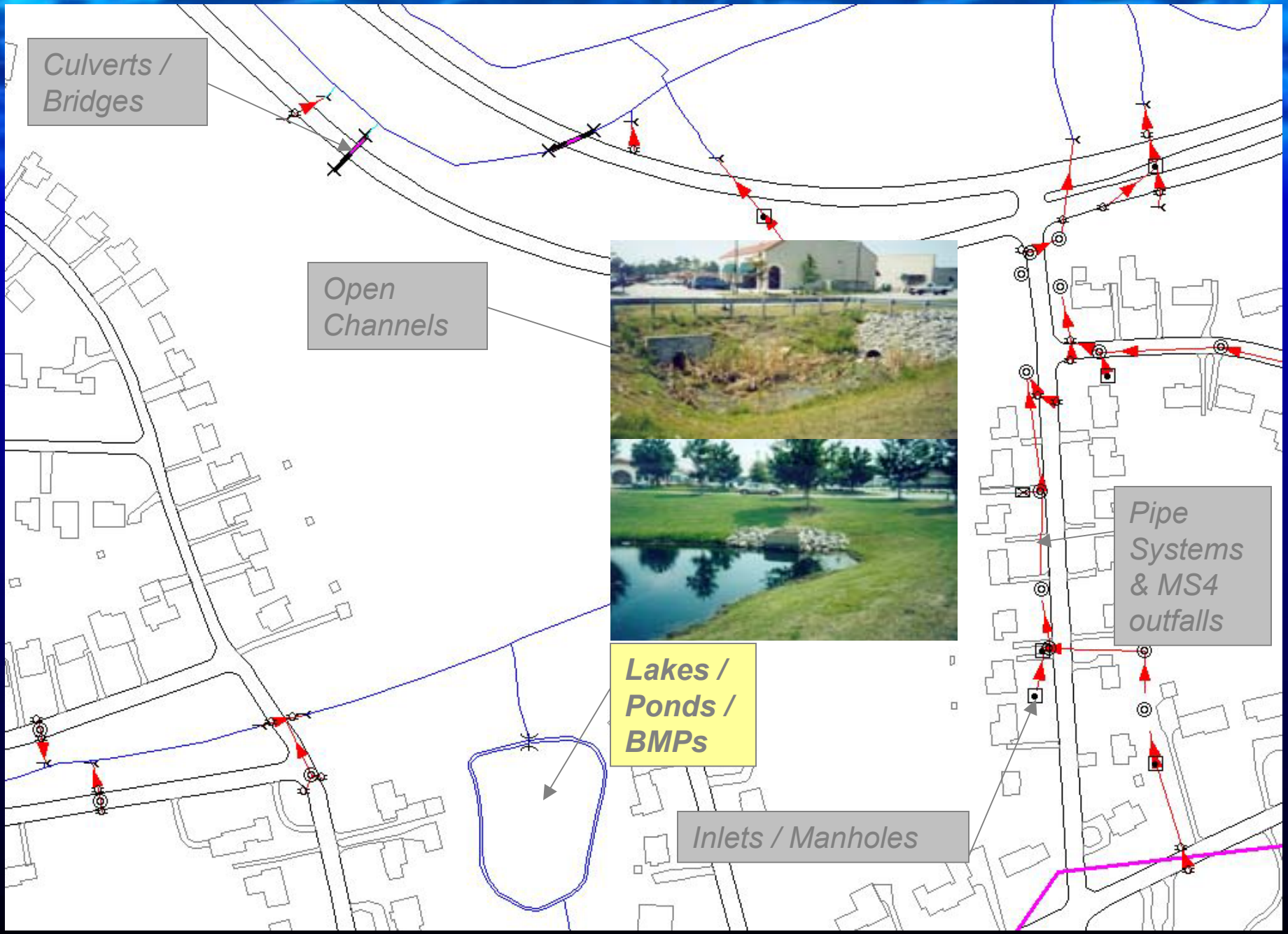
Inlets / Manholes

Pipe Systems & MS4 outfalls

Inlets / Manholes


Culverts / Bridges
Pipe Systems & MS4 outfalls
Inlets / Manholes


Culverts / Bridges
Open Channels
Pipe Systems & MS4 outfalls
Inlets / Manholes


Culverts / Bridges
Open Channels
Pipe Systems & MS4 outfalls
Lakes / Ponds / BMPs
Inlets / Manholes

Everything comes together in the GIS

Greensboro's inventory by the numbers...

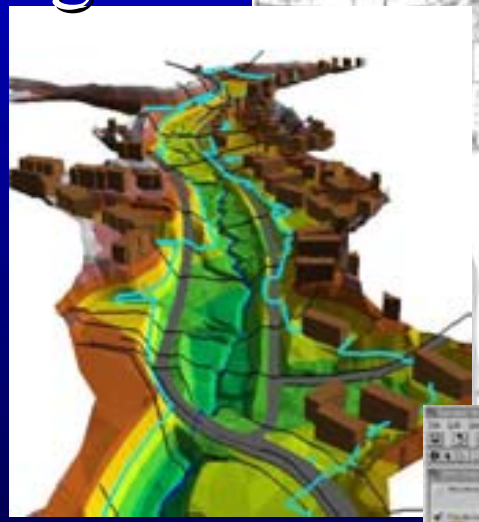
Select Feature Types	*Totals*
Inlets (all types)	***34,628***
Manholes	***8,289***
Culverts	***934***
Bridges	***65***
Pipes (closed systems)	***785 miles***
Open channel streams	***745 miles***
Swales	***96 miles***

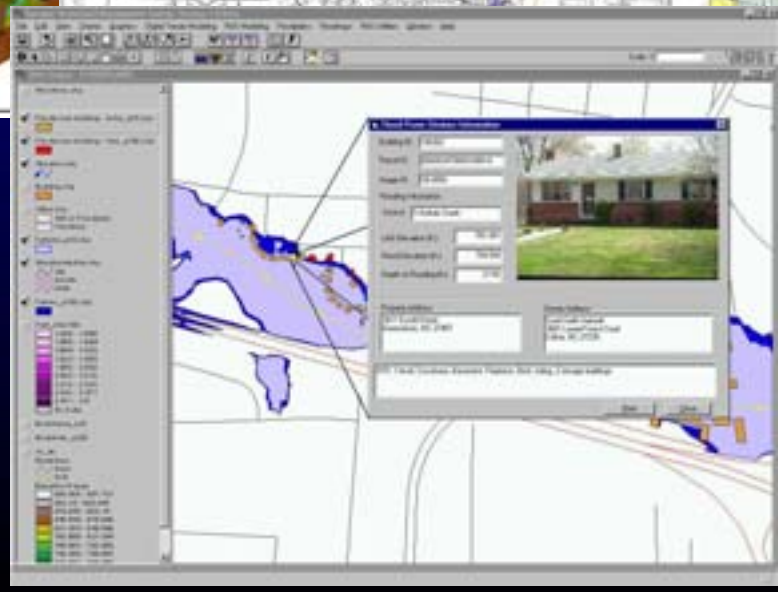
About 1 to 1.5 storm system structures per acre*

* For example, 1 storm inlet with 1 outgoing pipe would represent 2 structures.

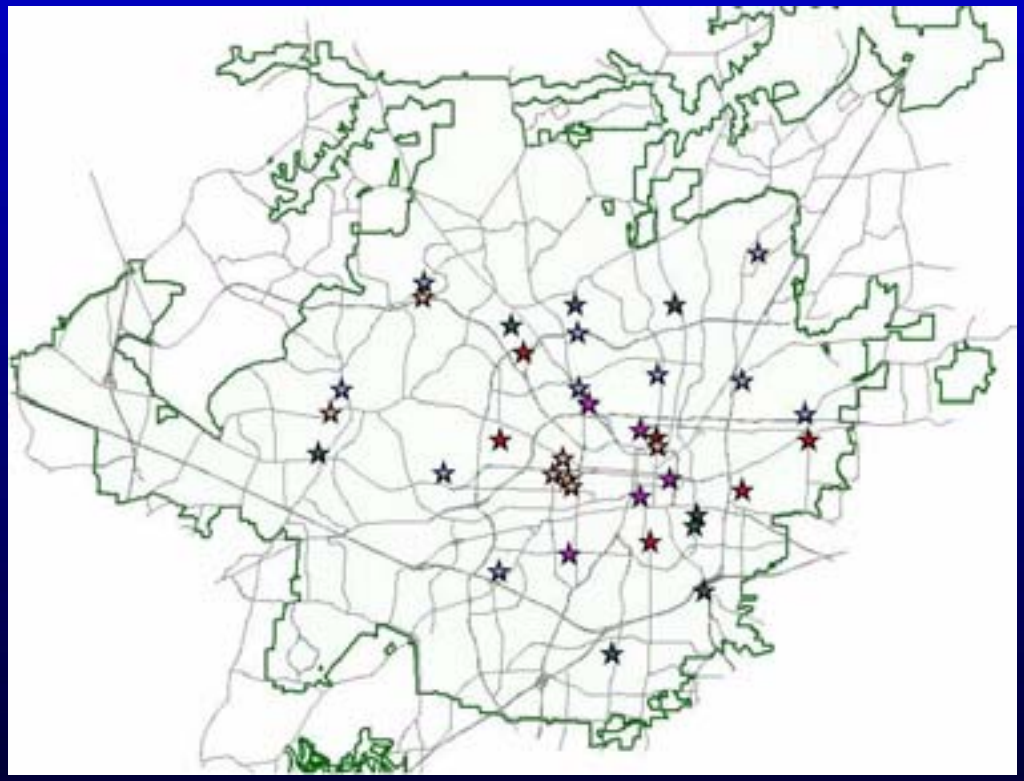
Stormwater Master Planning

- Watershed-based modeling & planning
- Multi-Objective:
  - Quantity
  - Quality
  - Protection of Drinking Waters
  - Floodplain Management
  - Ecology
  - Capital projects





Stormwater Capital Improvement Program



Over 50 projects citywide ranging from several thousand dollars to $2 million

South Buffalo Stormwater Wetland

Stream Restoration Projects & Programs

Sussman Park Stream Restoration Project

Stormwater Monitoring Programs

- Stormwater sampling
  - End of pipe
  - In-stream
- Ambient stream & lake monitoring
- Biological Monitoring
  - Benthic Macro & Fish Sampling
  - Habitat Assessment

- BMP Inspections & Monitoring
- Illicit discharge detection & improper disposal elimination
- Industrial inspections
- Water quality complaints
- Spill response assistance
- Water quality index

Public Education & Involvement

Adopt -a- Stream

Adopt -a- Street

Greensboro's Superhero BMP!

Public Education & Involvement

Construction Site Runoff Control

Reduce stormwater pollution from sites of 1 acre or more

- E&SC delegated to City
- Review site plans for compliance with BMPs
- Regular inspections and enforcement

Post-Construction BMPs & Inspections

- **Nonstructural**
  - Comprehensive Plan
  - Zoning Restrictions
  - Buffers & Open Space
- **Structural**
  - Wet Detention Ponds
  - Stormwater Wetlands
  - Bioretention Areas
  - Sandfilters
  - Over 300 in Greensboro

Stormwater Maintenance Programs

Stormwater Maintenance Programs

Stormwater Maintenance Programs

"Show Me the Money" – Stormwater Utility Update

- Stormwater "user fees" based on principle of impervious area
- 2 billing categories: single-family residential and non-single-family residential
- Current flat residential rate; Forthcoming tiered residential structure
- Fee crediting program as incentive for non-structural & structural BMP implementation

ERU-Based Fee Structure

SUBTOTALS:

Buildings	51,810
Parking	75,340

Total Impervious Surface

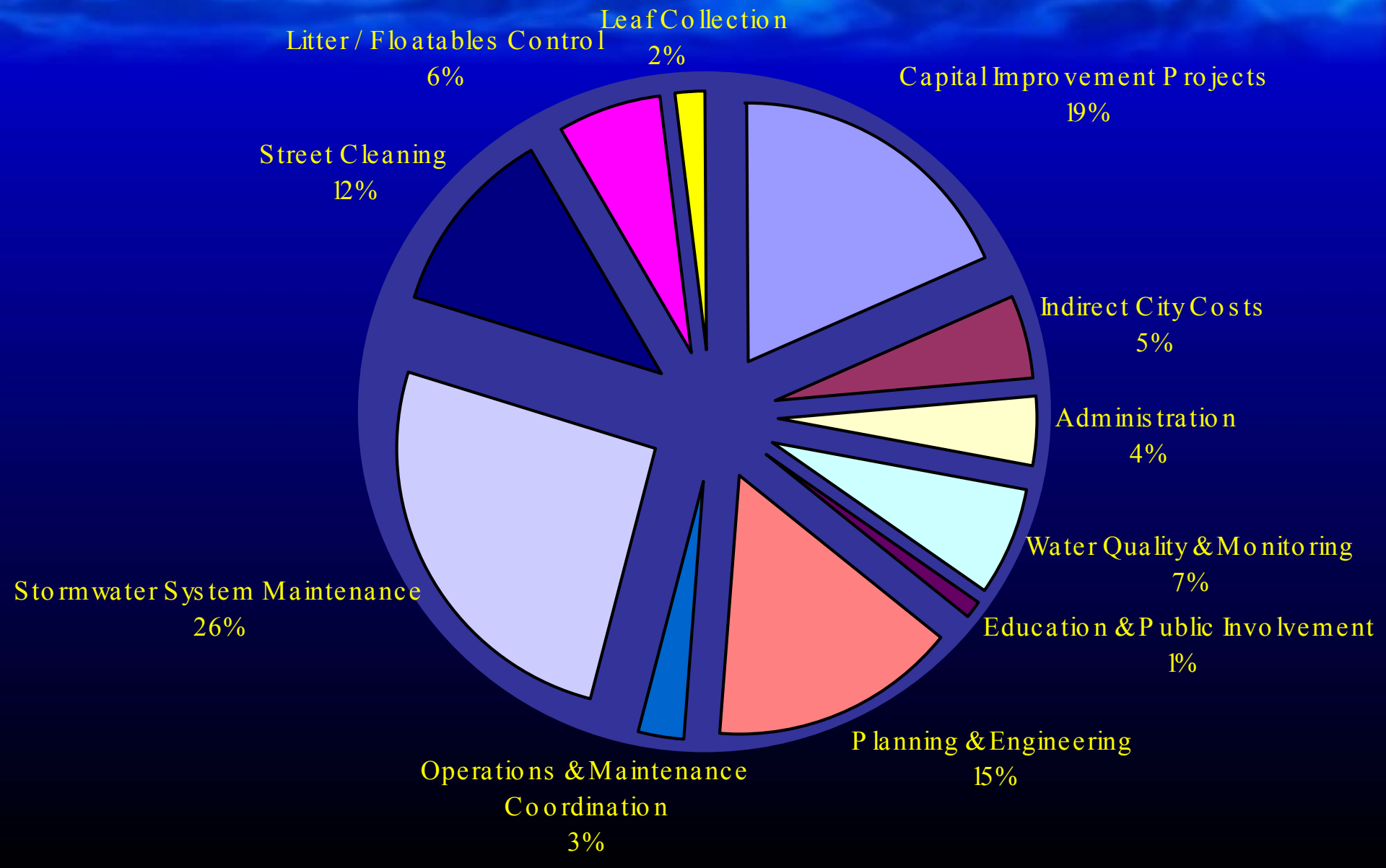
127,150 Square Feet

(1 E.R.U. = 2,543 sq ft)

Total E.R.U. = 50

Stormwater Fee = 50 ERU **x** $ per ERU

Stormwater Program Resource Allocation FY 03/04



Stormwater Virtuous Cycle

Thoughtful Vision & Focused Plans

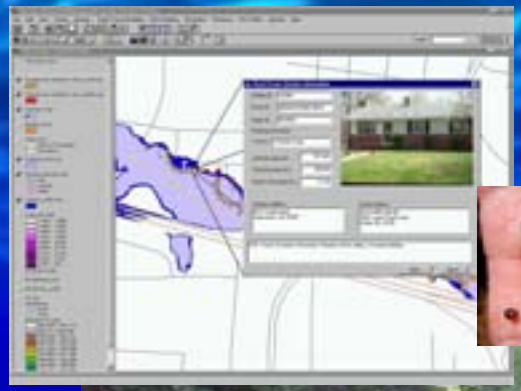
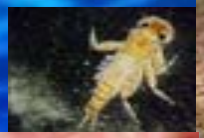
Program Implementation

Visible Results

Value Recognized

Team & Community motivated

People & Stakeholders









Questions?
Adopt
-a-
Stream